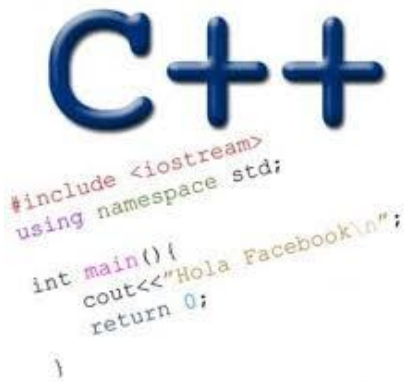
DYNAMIC MEMORY ALLOCATION LINKED LISTS

Problem Solving with Computers-I

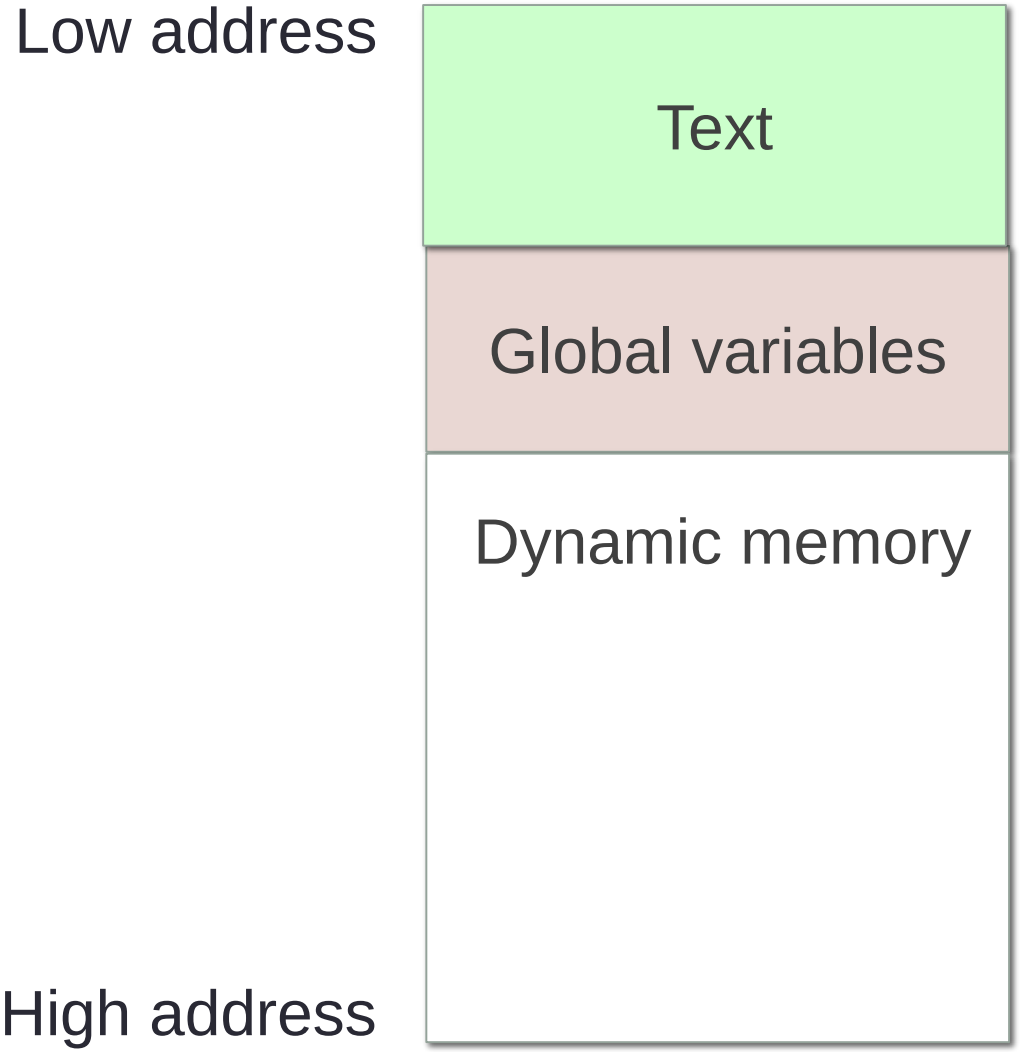
https://ucsb-cs16-sp17.github.io/



Review: Structs, arrays of structs

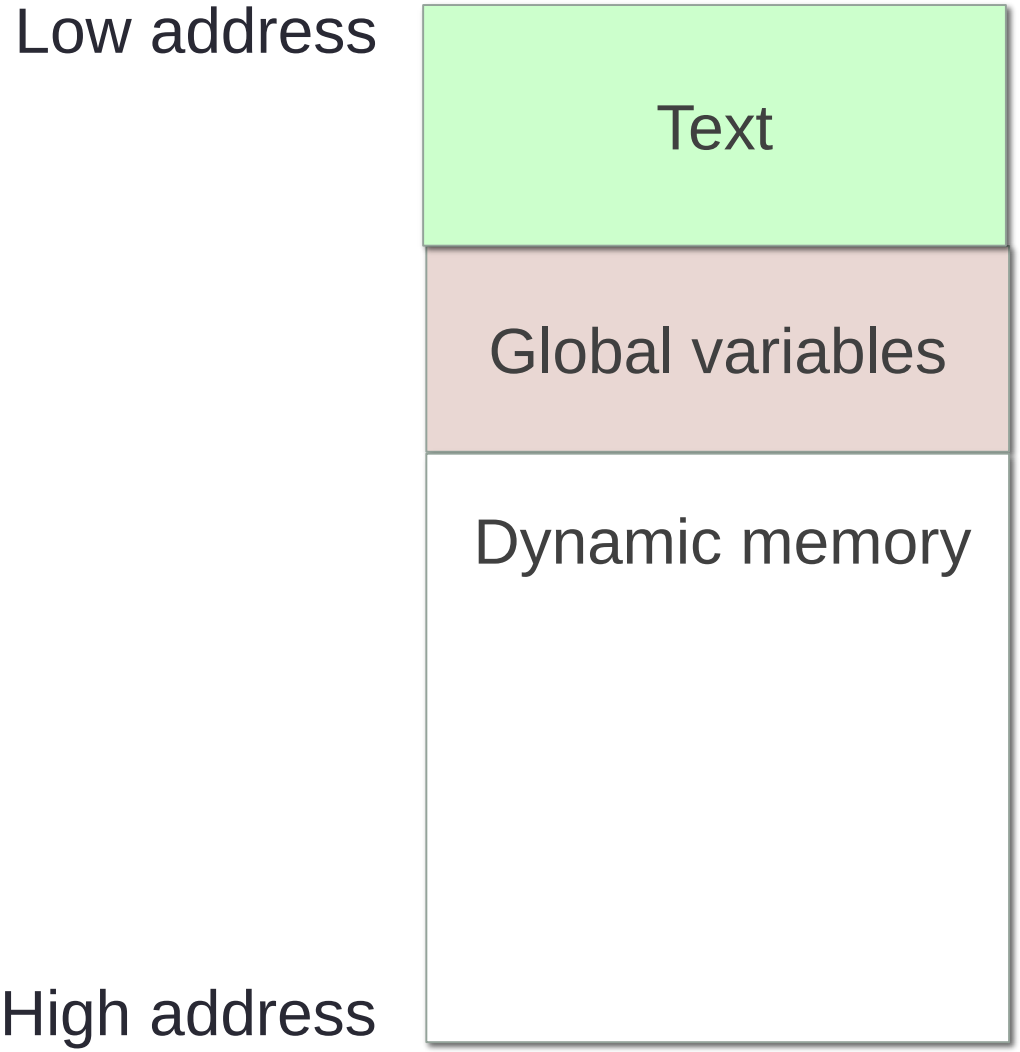
Program layout in memory at runtime

A generic model for memory



Creating data on the heap: new and delete

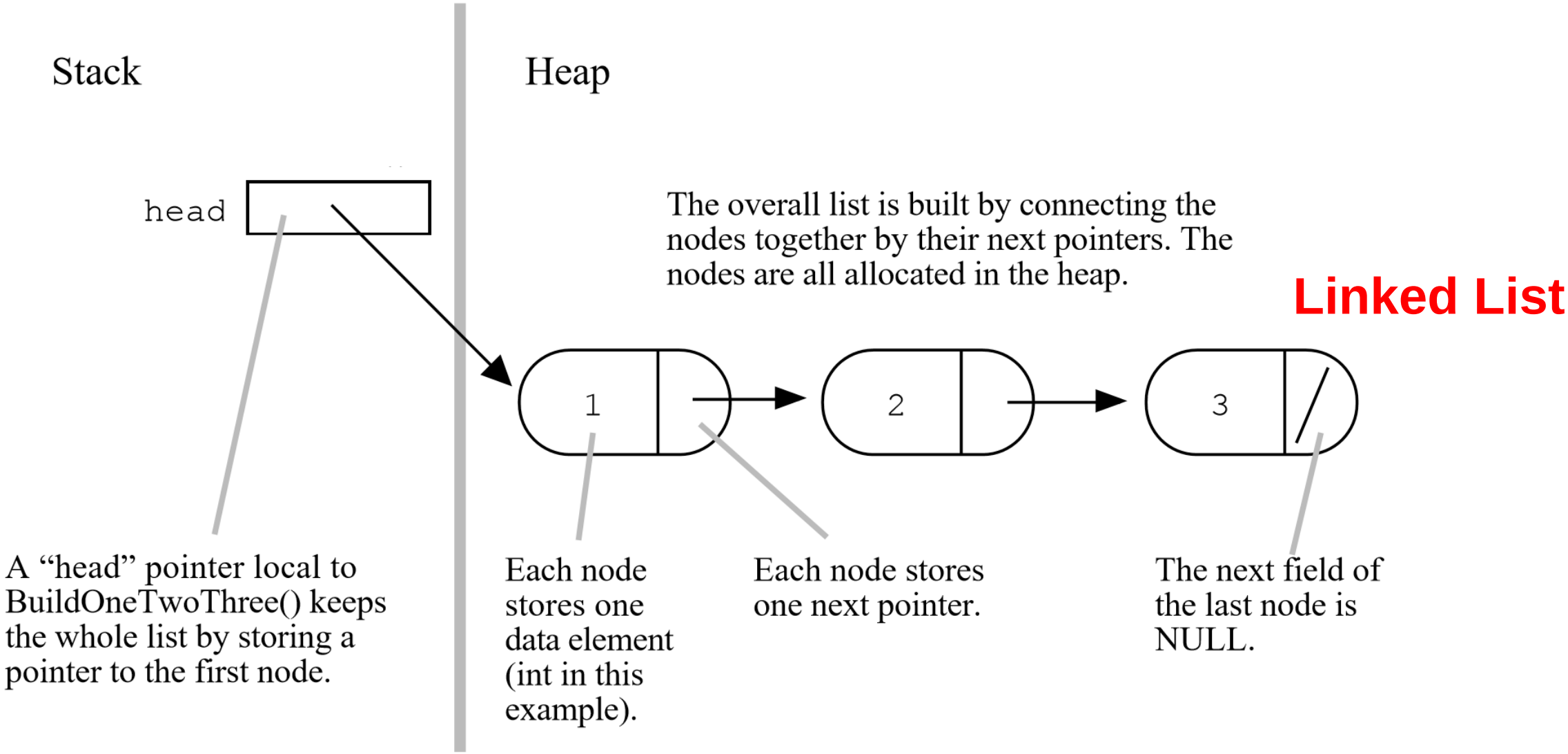
```
int foo() {
  int mycourse = 16;
  cout<<“Welcome to CS”<<mycourse;
}
```



Linked Lists

The Drawing Of List {1, 2, 3}

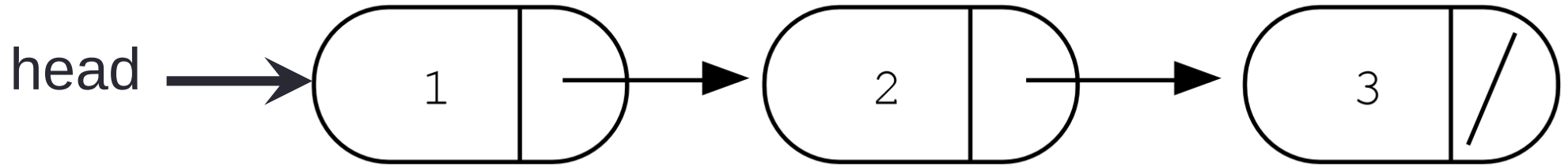
Array List



Linked List

Accessing elements of a list

```
struct Node {
      int data;
      Node *next;
};
```



Assume the linked list has already been created, what do the following expressions evaluate to?

1. head->data
2. head->next->data
3. head->next->next->data
4. head->next->next->next->data

A. 1
B. 2
C. 3
D. NULL
E. Run time error

Creating a small list

- Define an empty list
- Add a node to the list with data = 10

```
struct Node {
      int data;
      Node *next;
};
```

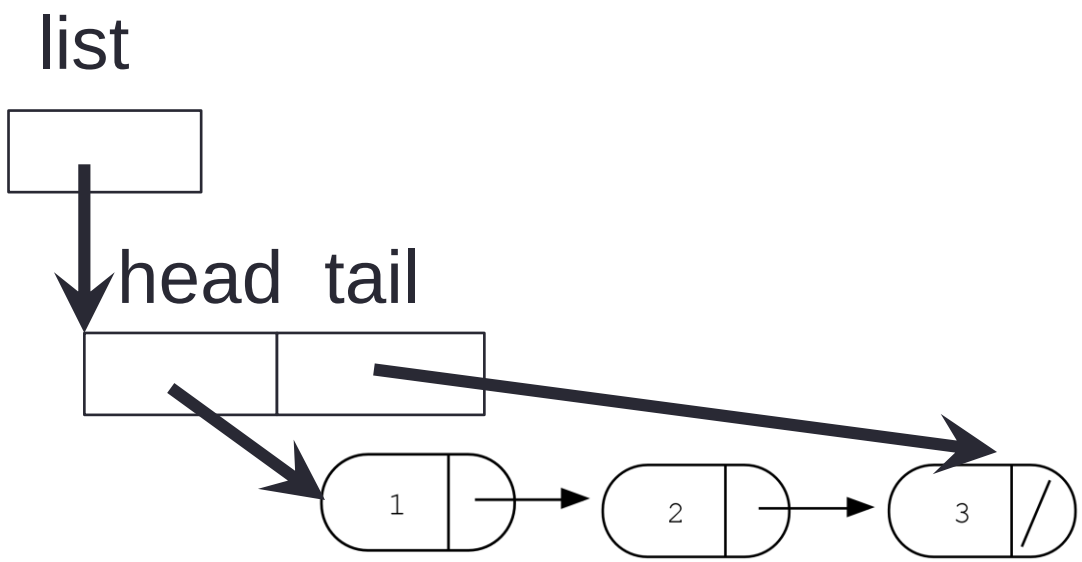
Building a list from an array

LinkedList * arrayToLinkedList(int a[], int size) ;

a

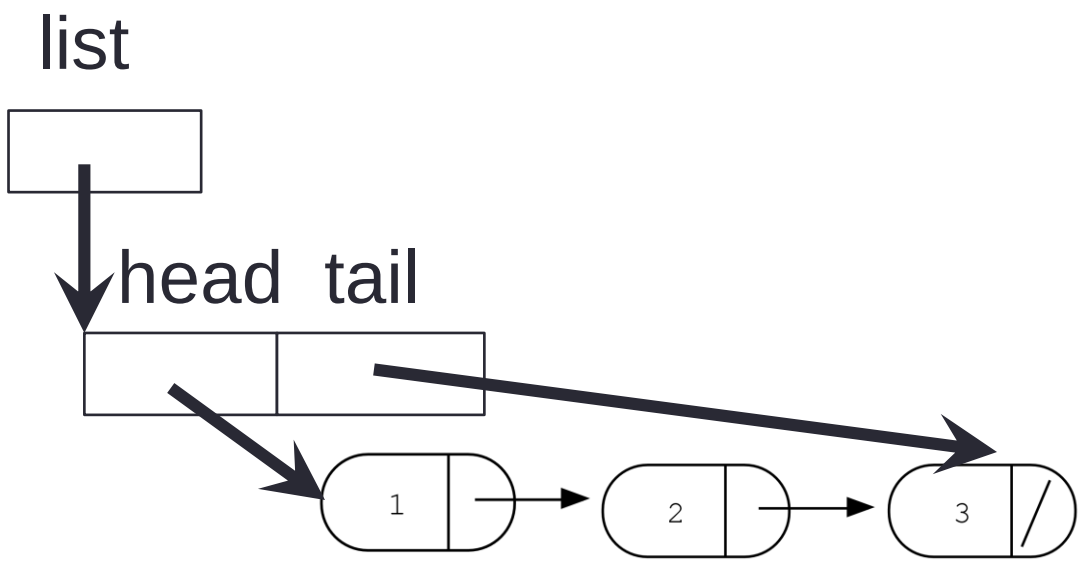
Iterating through the list

```
int lengthOfList(LinkedList * list) {
   /* Find the number of elements in the list */




}
```



Deleting the list

```
int freeLinkedList(LinkedList * list) {
   /* Free all the memory that was created on the heap*/
```




```
}
```

Next time

- Dynamic arrays
- Dynamic memory pitfall